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Mark Scheme (Results)

Summer 2013

International GCSE Mathematics A
4MA0/1FR

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
- Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
  - awrt – answers which round to.....
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent
  - indep – independent

- eeoo – each error or omission

- **No working**
  If no working is shown then correct answers normally score full marks

  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**
  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

  If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

  If there is no answer on the answer line then check the working for an obvious answer.

- **Ignoring subsequent work**
  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**
  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

Question	Working	Answer	Mark	Notes
1 (a)		¼	1	B1
(b)		25%	1	B1ft
(c)		3 correct lines of symmetry	2	B2 B1 for 1 correct line and no errors or 2 correct lines and 1 error.
				Total 4 marks

2 (a)		(2) thousand(s)	1	B1 accept 1000, 2000
(b)		4900	1	B1
(c)	6764 – 4880	1884	1	B1
(d)		4880	1	B1
(e)	27 + 143 or 27 – (−) 143	170	2	M1 A1 SC B1 for − 170 with no working.
(f)		(0).96	1	B1
(g)	96/100 or 48/50	24/25	2	M1 A1
				Total 9 marks

3 (a)		30	1	B1
(b)		28	1	B1 accept 26 < ans < 30
(c)		Boys bar = 25, Girls bar = 10	1	B1 Both bars correct.
(d)	20:15	4:3	2	M1 A1 SC B1 for 3:4 if or 1:(0).75 if M0 scored
				Total 5 marks

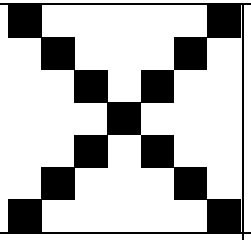
4 (a)		8.4 ± 0.2	1	B1
(b)	"8.4" ÷ 2	4.1 → 4.3inc	2	M1 A1 ft allow ft if 3 < ans < 10
				Total 3 marks

5 (i)		cube	1	B1 accept cuboid, rectangular or square based prism
(ii)		sphere	1	B1
(iii)		cone	1	B1
				Total 3 marks
6 (a) (i)		4.45pm	1	B1 pm needed in answer. Accept 15 mins to 5 pm etc
(a) (ii)		16 45	1	B1
(b)		one hand on 2, one hand	1	B1

		between 5 and 6		condone hand touching 5
				Total 3 marks

7 (a)		10.98	1	B1
	11.20 – 10.78	0.42	2	M1 or 11.2 and 10.78 isolated A1
	8 numbers in order	11.05	2	M1 or 11.03 and 11.07 isolated A1
				Total 5 marks

8 (a)	170 ÷36 (=4.722..)	4	2	M1 accept 4 x 36 (=144) or 5 x 36 (=180) A1 cao
(b)	170 – 4 x 36	26	2	M1 A1cao
				Total 4 marks

9 (a)			1	B1
(b)	(4 x 10) – 3	37	2	M1 A1
(c)	(81 +3) ÷ 4	21	2	M1 A1
(d)		$T = 4P - 3$	3	B3 B2 for $4P - 3$ or $T = 4P + n$ ($n \neq -3$) B1 for $4P + n$ (n ≠ – 3) or T = any linear expression in P
				Total 8 marks

10	180 – 130 (=50) 180 – 2 x "50"	80	3	M1 M1 A1
				Total 3 marks

11 (a)		1024	1	B1
(b)		8	1	B1
(c)		29	1	B1
				Total 3 marks

12 (a)		2/3 , 11/15, 4/5, 5/6	2	B2 B1 3 fractions in correct order or 2 fractions correctly converted to decimals (rounded or truncated) or 2 fractions expressed as equivalent fractions with denominator of 30 or 5/6, 4/5, 11/15, 2/3
(b)	$\frac{8}{18}-\frac{3}{18}$ **or** $\frac{8n}{18n}-\frac{3n}{18n}$ $\frac{8}{18}-\frac{3}{18}=\frac{5}{18}$ **or** $\frac{8n}{18n}-\frac{3n}{18n}=\frac{5n}{18n}\left(=\frac{5}{18}\right)$		2	M1 for 2 correct fractions with a common denominator a multiple of 9 & 6 A1 $\frac{5}{18}$ coming from $\frac{8}{18}-\frac{3}{18}$ **or** for final fraction equivalent to $\frac{5}{18}$
				Total 4 marks

13 (a) (i)		$5abc$	1	B1 letters and numbers in any order but no x signs
(ii)		$3q^5$	1	B1
(iii)		$5m - 3n$	2	B2 B1 for $5m$ or $-3n$
(b)		$t(t - 10)$	2	B2 Also accept $(t \pm 0)(t - 10)$ for B2 B1 for factors which, when expanded and simplified, give only two terms, one of which is correct. **SC** B1 for $t(t - 10t)$
				Total 6 marks

14	"135"÷ "90" (= 1.5) or "90"÷ "135" (= 2/3) or 4 x 42 (=168) "1.5" x 42 or 42 ÷ "2/3" or "135"/360 x "168"	63	3	M1 angles ± 2° (Total number of students) M1 "1.5", "2/3", dependent on measuring angles A1 accept 61 ≤ answer ≤ 65 if evidence of angles measured.
				Total 3 marks

15 (a)		Enlargement (Scale factor) 2 (Centre) (0,4)	3	B1 B1 B1 NB. Award no marks for more than one transformation (i.e. if not a **single** transformation)
(b)		Shape in correct position	2	B2 vertices at(2, 0) (6, 0) (10, – 4) (10, – 8) B1 any 2 vertices correct **or** correct orientation but wrong position **or** rotating shape P correctly - vertices at (7, 0), (9, 0) (11,−2), (11, −4)
(c)		y = 2	1	B1
				Total 6 marks

16 (a)	1 – (0.3 + 0.35 + 0.15)	0.2 oe	2	M1 for a complete method A1 for 0.2 oe as a fraction or percentage eg.20%, $\frac{1}{5}$ etc.
(b)	0.15 x 40 oe	6	2	M1 A1 cao NB. An answer of $\frac{6}{40}$ scores M1 A0
				Total 4 marks

17	495 ÷ 2.25	220	3	M2 M1 for 495÷2.15 **or** 230.2... rounded or truncated to 3 or more sig figs A1 cao
				Alterative M1 for 495÷135 **or** $3.\dot{6}$ **or** 3.666.. rounded or truncated to 3 or more sig figs M1dep "3.66.." x 60 A1 cao 220
				Total 3 marks

18 (a)	$\frac{6}{32}\times 100$	18.75	2	M1 Allow "32" from evidence of adding frequencies A1 Accept 19 if the correct method or 18.75 seen
(b)	(7x10)+(16x30)+(3x50)+(6x70) =70 + 480 + 150 + 420	1120	3	M1 f x x for 3 products with x used consistently within interval (inc. end points) & intention to add M1(dep) use of correct half way values ($\frac{1120}{32}$ implies M2) A1
				Total 5 marks

19	$3x=7-2x$ $5x=7$ or $5x-7=0$	1.4oe	3	M1 **or** $x=\frac{7}{3}-\frac{2x}{3}$ M1 **or** $\frac{5x}{3}=\frac{7}{3}$ **or** $x+\frac{2x}{3}=\frac{7}{3}$ A1 Answer dependent on at least M1
				Total 3 marks

20 (a) (i)		u, p, e, r	1	B1	Any order. Brackets and commas not necessary
(a) (ii)		s, c, o, m, p, u, t, e, r	1	B1 B0 if 'p' or 'u' or 'e' or 'r' repeated	
(b)		"no" 2 (or 3) are prime, 2 (or 3) belongs to *X* & *Y* etc	1	B1 identifies the element 2 **or** 3 **or** 2 and 3 eg $x \cap y = \{2,3\}$ dependent on "No" box ticked **or** "No" stated in answer with neither box ticked	
				Total 3 marks	

21 (a) (i)		6^8	1	B1	
(a) (ii)		9^{14}	1	B1 (oe e.g. 3^{28} ; 81^7)	
(b)	$5^n \times 5^3 = 5^{10}$ **or** $\frac{5^n}{5^6} = 5$ **or** $\frac{5^n}{5^3} = 5^4$ **or** $5^{n+3} = 5^{4+6}$ oe	 7	2	M1 or a correct equation in *n* eg *n* + 3 = 10 **or** *n* + 3 − 6 = 4 A1 **SC** B1 for an answer of 5^7	
				Total 4 marks	
22	$\pi \times 11^2$ (=380.132..) "380" x 18 (=6842.388..)	 6840	3	M1 or $\pi \times 22^2 \times 18$ (=27369.555) M1 dep M2 for $\pi \times 11^2 \times 18$ A1 awrt 6840 or 6850 if 22/7 used for π	
				Total 3 marks	

23	(x^2 =) 14.2² − 10.8² (=85) $x = \sqrt{85}$	 9.22	 3	M1 M1 dep (=9.21954..) A1 Awrt 9.22	
				Total 3 marks	

24	$4x = 18$ or $4y = 30$	$x = 4.5, y = 7.5$		M1 correctly eliminate 1 variable A1 A1	
				Total 3 marks	

				TOTAL: 100 MARKS	

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